



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US00/00604 (22) International Filing Date: 11 January 2000 (11.01.2000) (30) Priority Data: 60/115,388 11 January 1999 (11.01.1999) US (60) Parent Application or Grant SDGI HOLDINGS, INC. [/]; (). BOYD, Lawrence, M. [/]; (). BURKUS, J., Kenneth [/]; (). DORCHAK, John, D. [/]; (). BOYD, Lawrence, M. [/]; (). BURKUS, J., Kenneth [/]; (). DORCHAK, John, D. [/]; (). GANDY, Kenneth, A. ; ().		Published			
(54) Title: INTERVERTEBRAL SPACERS WITH SIDE WALL ACCESSIBLE INTERIOR CAVITY (54) Titre: ESPACEURS INTERVERTEBRAUX A CAVITE INTERIEURE ACCESSIBLE PAR UNE PAROI LATÉRALE					
(57) Abstract <p>Intervertebral spacers, tools for implanting intervertebral spacers and methods of promoting fusion bone growth in the space between adjacent vertebrae are provided. The spacers include an elongated body having a first end, a second end and an outer surface. Side walls connect the first and second ends. The elongated body also defines an interior cavity. The side wall defines an opening to the interior cavity in a side of the elongated body. At least one of the first and second ends has a discontinuity, such as a concave surface, for nesting with an adjacent spacer. The tools include spacer engaging means for engaging a spacer and occlusion means for blocking an opening defined in the spacer. In some embodiments, the occlusion means includes a plate extendible from the housing. In one specific embodiment the plate defines a groove which is disposed around a fastener attached to the housing so that the plate is slideable relative to the housing. The methods of promoting fusion bone growth include utilizing the inventive spacers described herein.</p> (57) Abrégé <p>L'invention concerne des espaceurs intervertébraux, des outils permettant d'installer ces espaceurs, et des techniques favorisant la croissance osseuse par fusionnement dans l'espace situé entre des vertèbres adjacentes. Ces espaceurs comprennent un corps allongé possédant une première extrémité, une seconde extrémité, et une surface extérieure. Les parois latérales relient les première et seconde extrémités. Le corps allongé définit également une cavité intérieure. Lesdites parois latérales définissent une ouverture vers la cavité intérieure, sur un côté du corps allongé. Au moins l'une des première et seconde extrémité présente une discontinuité, telle qu'une surface convexe, destinée à s'emboîter dans un espaceur adjacent. Les outils comprennent un organe d'engagement d'espaceur qui permet d'engager ledit espaceur, et un organe d'occlusion qui bloque une ouverture définie dans l'espaceur. Selon certains modes de réalisation, l'organe d'occlusion comprend une plaque extensible à partir du logement. Selon un mode de réalisation spécifique, la plaque définit une rainure entourant un système de fixation fixé au logement, de sorte que ladite plaque peut coulisser par rapport à ce dernier. Les techniques favorisant la croissance osseuse par fusionnement consistent à utiliser les espaceurs de cette invention.</p>					

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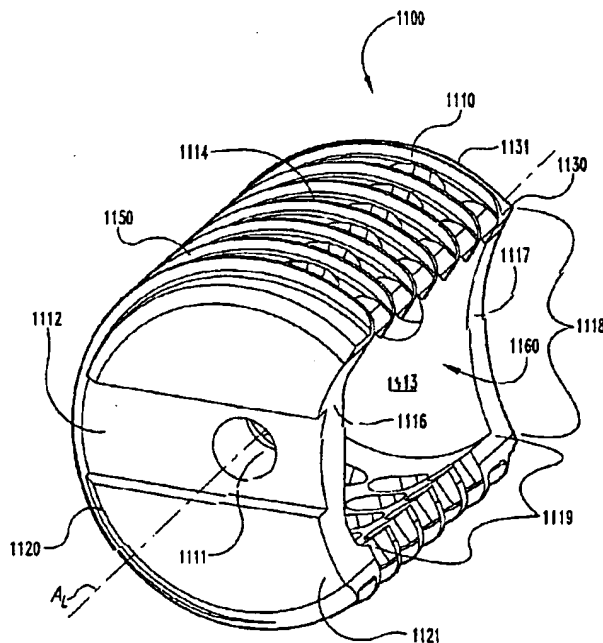
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- (71) Applicant (for all designated States except US): SDGI HOLDINGS, INC. [US/US]; Suite 508, 300 Delaware Avenue, Wilmington, DE 19801 (US).
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[Continued on next page]

(54) Title: INTERVERTEBRAL SPACERS WITH SIDE WALL ACCESSIBLE INTERIOR CAVITY



(57) Abstract: Intervertebral spacers, tools for implanting intervertebral spacers and methods of promoting fusion bone growth in the space between adjacent vertebrae are provided. The spacers include an elongated body having a first end, a second end and an outer surface. Side walls connect the first and second ends. The elongated body also defines an interior cavity. The side wall defines an opening to the interior cavity in a side of the elongated body. At least one of the first and second ends has a discontinuity, such as a concave surface, for nesting with an adjacent spacer. The tools include spacer engaging means for engaging a spacer and occlusion means for blocking an opening defined in the spacer. In some embodiments, the occlusion means includes a plate extendible from the housing. In one specific embodiment the plate defines a groove which is disposed around a fastener attached to the housing so that the plate is slideable relative to the housing. The methods of promoting fusion bone growth include utilizing the inventive spacers described herein.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

In International Application No.  
PCT/US 00/00604

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61F2/44

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 593 409 A (MICHELSON GARY K) 14 January 1997 (1997-01-14)  figures 41-43, 25, 30 column 12, line 55 - column 13, line 22 column 15, line 12 - line 29 claims 1-18	1, 3-20, 22-37, 52-57
Y	---	2, 21
Y	US 5 645 598 A (BROSNAHAN III ROBERT E) 8 July 1997 (1997-07-08) figures 4, 14 column 3, line 39 - column 5, line 61 --- -/-	2, 21

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

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03.10.2000

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

Int. Application No.  
PCT/US 00/00604

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 17209 A (HOECK JAMES E VAN ;SDGI HOLDINGS INC (US); BOYD LAWRENCE M (US); M) 30 April 1998 (1998-04-30) figures 3-8,47-49 page 14, line 11 -page 16, line 4 page 28, line 24 -page 29, line 26 ----	1-37, 52-57
A	EP 0 302 719 A (SHOWELL A W SUGICRAFT LTD) 8 February 1989 (1989-02-08) column 2, line 19 - line 52 figures 1-6 ----	1,19,20, 34,52,53
A	US 4 736 738 A (GLOBEVNIK JOZE ET AL) 12 April 1988 (1988-04-12) figures 12-29 column 4, line 8 - line 36 ----	38,39
A	US 5 423 825 A (LEVINE ANDREW S) 13 June 1995 (1995-06-13) figures 1-17 column 6, line 47 -column 8, line 50 -----	38,39

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 00/08604

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 40-51  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-37,52-57

An interbody fusion spacer.

2. Claims: 38-39

A spacer insertion tool.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

In International Application No.

PCT/US 00/00604

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